

**ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ**  
**RESEARCH & DEVELOPMENT**  
**DEPARTMENT**

# **Etidot-67**

## **HEALTH AND SAFETY**

### **DATA SHEET**

**Prepared by**

**Erhan TEKTAŞ**

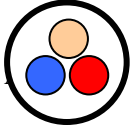
**ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ**

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## 1. Identification of the Substance / Preparation and the Company / Undertaking

### Product name

Etidot-67

### Chemical name/synonyms

Disodium octaborate tetraborate

### Use of the substance / preparation

The product is used in industrial manufacturing, in particular in:

- Agriculture (micronutrient, insecticide )
- Wood protection ( insecticide, fungicide)
- Flame retardant

### Supplier

**Name :** ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ

**Address :** Cihan Sok. No:2 06430 Sıhhiye- Ankara, Türkiye

**Phone No:** 00 90 312 294 20 00

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**Emergency phone number:** 00 90 312 294 23 38

## 2. Composition / Information on Ingredients

### Chemical nature of the substance / preparation

The product contains greater than 98 percent (%) disodium octaborate tetrahydrate.

### Components

CAS- No	EINECS	Name
12280-03-4	234-541-0	Disodium octaborate tetrahydrate

For other "Chemical inventory listing", please refer to section 15.

## 3. Hazards Identification

### Emergency overview

Etidot-67 is a white odourless, powder substance that is not flammable, combustible, or explosive, and has low acute oral and dermal toxicity.

### Potential health effects

Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because Etidot-67 is poorly absorbed through intact skin.

### Inhalation

Occasional mild irritation effects to nose and throat may occur from inhalation of Etidot-67 dusts at levels greater than 10 mg/m<sup>3</sup>.

### Eye contact

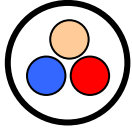
Etidot-67 is non-irritating to eyes in normal industrial use.

### Skin contact

Etidot-67 does not cause irritation to intact skin.

### Ingestion

Products containing Etidot-67 are not intended for ingestion. Etidot-67 has low acute toxicity. Small amounts (e.g. a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.



### **Cancer**

Disodium octaborate tetrahydrate is not a known carcinogen.

### **Reproductive/developmental**

Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.

### **Target organs**

No target organ has been identified in humans. High dose animal ingestion studies indicate the testes are the target organs in male animals.

### **Potential ecological effects**

Large amounts of Etidot-67 can be harmful to plants and other species. Therefore, the product should only be used as part of a balanced plant nutrition program preferably after soil and/or tissue analysis. Accidental releases to the environment should be minimized.

### **Signs and symptoms of exposure**

Symptoms of accidental over-exposure to Etidot-67 have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling (see section 11).

## **4. First Aid Measures**

### **Skin contact**

No treatment necessary because non-irritating.

### **Eye contact**

Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical attention.

### **Inhalation**

If symptoms such as nose or throat irritation are observed, remove person to fresh air.

### **Ingestion**

If large amounts are swallowed (i.e. more than one teaspoon), give two glasses of water or milk to drink and seek medical attention.

#### **Note to physicians**

Observation only is required for adult ingestion of less than 4 grams of Etidot-67. For ingestion in excess of 4 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment<sup>[1]</sup> (see section 11).

## **5. Fire-Fighting Measures**

### **General hazard**

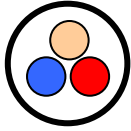
None, because Etidot-67 is not flammable, combustible or explosive. The product is itself a flame retardant.

### **Extinguishing media**

Any fire extinguishing media may be used on nearby fires.

### **Flammability classification:**

Non-flammable solid.



## 6. Accidental Release Measures

### Personal precautions

Avoid dust formation. In case of exposure to high level of airborne dust, wear a personal respirator in compliance with national legislation.

### Environmental precautions

Etidot-67 is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption (see section 12).

### Methods for cleaning up (Land spill)

Vacuum, shovel or sweep up Etidot-67 and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal. No personal protective equipment is needed to clean up land spills.

### Spillage into water

Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level (see sections 12, 13 and 15).

## 7. Handling and Storage

### Safe handling advice and storage

No special handling precautions are required, but dry, indoor storage is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in first-out basis. Good housekeeping procedures should be followed to minimize dust generation and accumulation. Your supplier can advise you on safe handling, please contact him.

## 8. Exposure Controls / Personal Protection

### Exposure limit values

Respect regulatory provisions for dust (inhalable and respirable).

### Exposure controls

#### A. OCCUPATIONAL EXPOSURE CONTROLS

Use local exhaust ventilation to keep airborne concentrations of Etidot-67 dust below permissible exposure levels.

- *Respiratory protection*  
Where airborne concentrations are expected to exceed exposure limits, respirators should be used.
- *Eyes and hands protection*  
Goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

Disodium octaborate tetrahydrate is treated by OSHA, Cal OSHA and ACGIH.

ACGIH/TLV :	10 mg/m <sup>3</sup>
Cal OSHA/PEL :	10 mg/m <sup>3</sup>
OSHA PEL (total dust) :	15 mg/m <sup>3</sup>
OSHA/PEL (/respirable dust) :	5 mg/m <sup>3</sup>

#### B. ENVIRONMENTAL EXPOSURE CONTROLS

No special requirement.



## 9. Physical and Chemical Properties

### General information

Physical state	powder, solid
Colour	white
Odour	odourless
Molecular weight	412,5

### Important health, safety and environmental information

Melting temperature	815 °C
Boiling point	Not applicable
Flash point	Non flammable
Explosion hazard	Non explosive
Solubility in water	9.7 % @ 20°C; 27.4 @ 40°C
Vapour pressure	Negligible @ 20°C
pH @ 20°C	8.5 (1.0% solution) 8.0 (5.0% solution) 7.6 (10 % solution)

## 10. Stability and Reactivity

### General

Etidot-67 is a stable product.

### Hazardous decomposition or polymerisation

None

### Incompatible materials and conditions to avoid

Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

## 11. Toxicological Information

### Acute toxicity

#### Ingestion<sup>[2]</sup>

Low acute oral toxicity; LD<sub>50</sub> in rats is 2,550 mg/kg of body weight.

#### Skin/dermal

Low acute dermal toxicity; LD<sub>50</sub> in rabbits is greater than 2,000 mg/kg of body weight. Etidot-67 is poorly absorbed through intact skin.

#### Inhalation

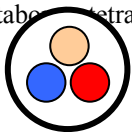
Low acute dermal toxicity; LC<sub>50</sub> is greater than 2.0 g/m<sup>3</sup>.

#### Skin irritation

Non-irritant.

#### Eye irritation

Draize test in rabbits produced mild eye irritation effects. Many years of occupational exposure to disodium octabore tetrahydrate indicate no adverse effects on human eye.



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## Sensitization

Etidot-67 is not a skin sensitizer.

## OTHER

### Reproductive/developmental toxicity

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes<sup>[2]</sup>. Studies in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus including foetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to<sup>[3,4,5]</sup>.

### Carcinogenicity/mutagenicity

No evidence of carcinogenicity in mice.

No mutagenic activity was observed for boric acid in battery of short-term mutagenicity assays.

### Human data

Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

## 12. Ecological Information

### ECOTOXICITY DATA

#### General

Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert disodium octaborate tetrahydrate into equivalent boron (B) content, multiply by 0.2096.

#### Phytotoxicity

Boron is an essential micronutrient for healthy growth of plants, however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimize the amount of borate product released to the environment. Etidot-67 should only be used as part of a balanced plant nutrition program preferably after soil and/or tissue analysis.

#### Algal toxicity<sup>[6]</sup>

Green algae, *Scenedesmus subspicatus*

96-hr EC<sub>10</sub> = 24 mg B/l †

#### Invertebrate toxicity<sup>[7]</sup>

Daphnids, *Daphnia magna* Straus

24-hr EC<sub>50</sub> = 242 mg B/l †

#### Fish toxicity

Sea water<sup>[8]</sup>:

Dab, *Limanda limanda* 96-hr LC<sub>50</sub> = 74 mg B/l †

Fresh water<sup>[9]</sup>:

Rainbow trout, *Salmo gairdneri* (embryo-larval stage)

24-day LC<sub>50</sub> = 88 mg B/l †

32-day LC<sub>50</sub> = 54 mg B/l †

Goldfish, *Carassius auratus* (embryo-larval stage)

7-day LC<sub>50</sub> = 65 mg B/l †

3-day LC<sub>50</sub> = 71 mg B/l †

Test substance: † Sodium tetraborate



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## ENVIRONMENTAL FATE DATA

### Persistence/degradation

Boron is naturally occurring and ubiquitous in the environment. Etidot-67 decomposes in the environment to natural borate.

### Octanol/Water partition coefficient

No data. In aqueous solution disodium octaborate tetrahydrate is converted substantially into undissociated boric acid.

### Soil mobility

The product is soluble in water and is leachable through normal soil.

## 13. Disposal Considerations

### Disposal guidance

Small quantities of Etidot-67 can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

## 14. Transport Information

**International transportation :** Disodium octaborate tetrahydrate has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

**DOT hazardous classification:** Disodium octaborate tetrahydrate is not regulated by the U.S. Department of Transportation and is therefore not considered a hazardous material/substance.

**TDG Canadian transportation:** Disodium octaborate tetrahydrate is not regulated under Transportation of Dangerous Goods.(TDG)

## 15. Regulatory Information

### General

Ensure all national/local regulations are observed.

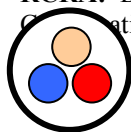
**OSHA/Cal OSHA:** This MSDS document meets the requirements of both OSHA (29 CFR 1910.1200) and Cal OSHA (title 8CCR 5194 (g)) hazards communication standards.

**WHMIS Classification:** Disodium octaborate tetrahydrate is classified as Class D-Division 2A under Canadian WHMIS guidelines

**Chemical Inventory Listing:** Disodium octaborate tetrahydrate 12280-03-4, appears on several chemical inventory lists including the EPA TSCA inventory, Canadian DSL, European EINECS, Japanese MITI, Australian and Korean lists, under the CAS No. representing anhydrous form of this inorganic borate.

- U.S. EPA TSCA Inventory 1208-41-2
- Canadian DSL 1208-41-2
- EINECS 234-541-0
- South Korea 9312-3213

**RCRA:** Disodium octaborate tetrahydrate is not listed as a hazardous waste under any sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR 261 et seq).



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**Superfund:** CERCLA/SARA: Disodium octaborate tetrahydrate is not listed under CERCLA or its 1986 amendments, including substances listed under Section 313 of SARA, Toxic Chemicals, 42 USC 11023.40 CFR 372.65, Section 313 of SARA, Toxic Chemicals, 42 USC 11023.40 CFR 372.65, Section 302 of SARA

Extremely Hazardous Substances List, 42 USC 11002, 40 CFR 355, or the CERCLA Hazardous Substances List, 42 USC 9604, 40 CFR 302.

**Safe Drinking Water Act (SDWA):** Disodium octaborate tetrahydrate is not regulated under the SDWA, 42 USC 300(g)-1, 40 CFR 141 et seq. Consult state and local regulations for possible water quality advisories regarding boron compounds.

**Clean Water Act (CWA) (Federal Water Pollution Control Act):** 33 USC 1251 et seq.

a) Disodium octaborate tetrahydrate is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33 USC 1314.

b) It is not on the Section 307 List of Priority Pollutants, 33 USC 1317, 40 CFR 129.

c) It is not on the Section 311 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

**Canadian Drinking Water Guidelines:** An "Interim Maximum Acceptable Concentration" (IMAC) for boron is currently set at 5 mg/B/L.

**IARC:** The International Agency for Research on Cancer (IARC) (a unit of the World Health Organization) does not list or categorize Disodium octaborate tetrahydrate as a carcinogen.

**NTP Biennial Report on Carcinogens:** Disodium octaborate tetrahydrate is not listed.

**OSHA Carcinogen:** Disodium octaborate tetrahydrate is not listed.

**California Proposition 65:** Disodium octaborate tetrahydrate is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.

**Federal Food, Drug and Cosmetic Act:** Pursuant to 21 CFR 175.105, 176.180 and 181.30, Disodium octaborate tetrahydrate is approved by the FDA for use in adhesive compounds of packaging materials, as a component of paper coatings on such materials or for use in the manufacture thereof, which materials are expected to come in contact with dry food products.

**Clean Air Act (Montreal Protocol):** It was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

## 16. Other Information

### References

1. Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. (1986), 4, 427-458
2. Weir R J, Fisher R S, Toxicol. Appl. Pharmacol., (1972), 23, 351-364
3. National Toxicology Program (NTP) – Technical Report Series No. TR324, NIH Publication No. 88-2580 (1987), PB88 213475/XAB
4. Fail *et al.*, Fund. Appl. Toxicol. (1991) 17, 225-239
5. Heindel *et al.*, Fund. Appl. Toxicol. (1992) 18, 266-277
6. Guhl W, SÖFW-Journal (1992) 181 (18/92), 1159-1168
7. Schöberl P, Marl and Huber L (1988) Tenside Surfactants Detergents 25, 99-107
8. Hugman S J and Mance G (1983) Water Research Centre Report 616-M
9. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085

For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Industrial Hygiene and Toxicology, 4th Edition Vol. II, (1994) Chap. 42, 'Boron'.